

are also forty-eight pages of excellent photographs, and finally an illustrated appendix descriptive of the birds photographed by the author. This appendix is the work of Captain G. S. Tuck, Chairman of the Royal Naval Bird-Watching Society. The whole book is an excellent introduction to the labours and rewards of bird-watching and bird photography for those who are not already practitioners, and to those who are it serves to introduce a strange and remote bird world which most of us will never see. Mollyhawks, Wanderers, Nellies, Noddies, and Stinkers are unlikely to pass before the ordinary man's eye or camera lens, but they can be found in this book. Finally, any amateur who thinks of writing up natural history notes or observations will find here a model style, as compact as it is lively.

J.G.

3. THE FAUNA OF INDIA INCLUDING PAKISTAN, BURMA AND CEYLON : MAMMALIA (Second Edition). Vol. III. Rodentia. By J. R. Ellerman. With an appendix by M. L. Roonwal and B. Biswas. Part 1, pp. xxx+482, with 34 figures; Part 2, pp. lii+483-884, with 20 figures and a map; 23.5×16.5 cm. Calcutta, 1961. Zoological Survey of India. Price for Parts 1 and 2 together: Inland Rs. 46; Foreign 107s. 4d. or \$ 16.56.

The two parts comprising this third volume of the second edition on the Mammalia in the series FAUNA OF INDIA are devoted entirely to the Rodentia and have been written by Sir John Ellerman, an acknowledged authority on this complex Order. They maintain the high standard of the earlier volumes on the Primates and Carnivora by the late R. I. Pocock, and, like these volumes, are based on the extensive collections of the British Museum (Natural History). Although the work is avowedly concerned only with the rodents of the Indian sub-continent it cannot be considered parochial: the author notes that his conclusions are derived from the examination of some 13,000 specimens from Asia, Europe, North Africa, and Australia, and throughout the work reference is made to the study of specimens from the adjacent parts of the Palaearctic and Malaysian regions. The editor of the series is to be congratulated on the breadth of this concept, which permits a soundly based study: if for no other reason, a work of a scope such as this merits careful examination.

The general objective of the series FAUNA OF INDIA 'is to produce authoritative taxonomic monographs of a high scientific standard on the

different groups of Indian animals . . .'. There can be no doubt that this aim is admirably fulfilled by the present volume. It is a comprehensive and detailed taxonomic review of the Indian Rodentia, based on a broad spectrum of their diagnostic features and prepared in a critical and objective fashion. It follows the general pattern set by the earlier volumes on the Primates and Carnivora. The Order Rodentia is defined and the reasons for excluding the lagomorphs as a separate Order discussed in the introduction, which includes remarks on the classification of the Order with a key to the families and subfamilies of Indian rodents and a brief review of their distribution. The systematic account provides a definition and discussion of each family, with a key to its included genera. Diagnoses of genera and species follow in considerable detail, with especial emphasis on cranial and dental characters. Keys to species and subspecies are provided where necessary: the diagnostic features of subspecies are reviewed in some detail, with external and cranial measurements. Distributional data are provided at all levels and precise localities are given for the Indian specimens examined during the preparation of the work. Extant problems in the taxonomic study of Indian rodents are discussed in considerable detail at whatever level of classification they occur and the author sets out his conclusions clearly and concisely. The habits and ecology of Indian rodents receive less attention than was devoted to these topics in the earlier volumes on Primates and Carnivora, a reflection of the fact that rodents are less easily observed.

This volume is the first detailed study of the rodents of the Indian sub-continent to appear since the publication of part 2 of the first edition of the volume on the Mammalia by W. T. Blanford in 1891, and it reflects very clearly the considerable advances that have been made in Indian mammalogy since that date. Blanford had under consideration a total of 21 groupings of simplicidentate rodents which he thought of generic validity. These occupy some 90 pages of text. Seventy years later, the present work contemplates a total of 46 such groupings, involving a text nearly ten times as long as that of Blanford. The increase in knowledge is largely due to the Bombay Natural History Society, whose initiation of the Mammal Survey of India, Burma, and Ceylon began a great upsurge of interest in the detailed study of Indian mammals. It may be said in truth that without the work of the Survey, the present study of the rodents of India could never have appeared in its present form, for the Survey provided for the first time the extensive series of specimens without which no comprehensive study of a fauna can be made. Hitherto, the principal work on the large collections of rodents obtained by the Survey has

been a long series of papers by Wroughton and Thomas published in the early part of this century and summarized by Wroughton. Now, in the present volume, this has been critically reviewed and the results of the Survey and other collections expanded into a comprehensive treatment. The author has had the advantage of having much original material for his studies, supplemented in many cases by extensive series derived from further collecting, and has been able to take a wide view of the rodent fauna of the region.

Sir John Ellerman is best known for his monumental volumes on THE FAMILIES AND GENERA OF LIVING RODENTS and it is abundantly evident that his undoubted abilities as a diagnostician have been fully employed in his study of the Indian Rodentia. His definitions at the level of the family, genus, and the species are a model of their kind within the purpose of the work and especially in the context of cranial and dental characters. Meticulous attention to detail has been applied at the level of the subspecies, wherever sufficient specimens were available to justify such treatment. As might be expected, at this level of classification, less importance is attached to cranial and dental characters which to a large extent are replaced by those of absolute size, proportion, and colour, and it is here that the value of the extensive series examined by the author becomes apparent. For the first time for many widespread Indian species, a detailed comparison of many of their subspecies one with the other has been made, so that the pattern of regional variation becomes clearer. This work by Ellerman assumes an importance denied to the studies by Wroughton and Thomas, which were primarily those of analysis, in contrast to the synthesis practised in the present study.

The text of this volume was completed for publication in 1946 but for various reasons did not appear in print until 1961. However, the author has included his later thinking on the minor classification of Indian rodents. For example, in the genus *Rattus*, he has included the subgenera *Leopoldamys* and *Berylymys* which he proposed in 1947 and his views on the vexed question of *Rattus rajah* and *Rattus surifer* as expressed in the present work are in accord with his opinions on the point foreshadowed in his 'Key to the Rodentia inhabiting India, Ceylon and Burma' (1947, *J. Mammal.* 28 : 249-278, 357-389) and set out in the CHECKLIST OF PALAEARCTIC AND INDIAN MAMMALS (1951) and the INDEX TO CHASEN (1940) A HANDLIST OF MALAYSIAN MAMMALS (1955). In this way he has embodied his more recent views into the text, which do not always agree in minor detail with the conclusions of the third volume of THE FAMILIES AND GENERA OF LIVING RODENTS, itself completed in 1946 but not published until 1949. This situation

is further rectified by the provision of an appendix by M. L. Roonwal and B. Biswas, listing rodents described as new from the region during the period 1946-1960, with a summary of their diagnostic characters. It is clearly less easy to draw attention to further work which modifies or expands the conclusions expressed in the text but this has been done in a few cases by the provision of a footnote. The work consequently suffers little from the delay in publication: such published work as has been unavoidably excluded does not affect it to any serious extent.

Attention may be drawn to a few small points that are misleading or inconsistent. The measurement known in mammalogy as condylobasal length is defined on p. 11 as 'from the occiput to the front of the incisor' as opposed to the more usual method of obtaining this value which takes as its posterior points of reference the hindmost surfaces of the occipital condyles and as its anterior point the foremost part of the premaxillae, at or close to the mid-line. Inconsistencies can be found in the spelling of place names: for example, the locality Charwa, in Cutch, appears variously as Chalwar, Charwa, and Charwar. Similarly, skin and skull studies do not always correspond precisely with each other or with the text: for example, in the table of external measurements for *Rattus niviventer*, it is said under *R. n. mentosus* that 'the following skins may also belong here', yet in the table of cranial measurements for this species the skulls associated with certain of these skins are listed definitively as *R. n. mentosus* while in the text the localities whence these skins came are included definitively within the distribution of that subspecies. The detailed and valuable tables of measurements could perhaps have been improved by the consistent specification of the specimens to which the measurements refer: this has been done to some extent by quoting the Museum registration numbers (or collector's numbers for unregistered collections) for all of the skulls measured but such numbers are quoted only rarely for the skins of which external measurements are given, thus rendering impossible the association of the two sets of measurements in all but a few cases. These minor criticisms do not minimise the value of the book and some may derive from its preparation during time of war when the collections and libraries of the British Museum (Natural History) were widely dispersed.

There can be no doubt that Sir John Ellerman has made a major contribution to Indian mammalogy. For the first time the student has available a comprehensive treatise on the Rodentia of the Indian sub-continent which brings together the plethora of names applied to this widely varied group and which provides a thorough comparative study of the majority of named forms from the region. The author

has brought to his subject a remarkable power of detailed diagnosis and definition which has resulted in a clear and unified treatment of certainly the largest, and probably the most diverse, group of Indian mammals. This volume will remain for many years the standard text on the Rodentia of the Indian sub-continent and, as such, will be indispensable to any student of the mammalian fauna of that region or of the Order Rodentia as a whole.

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4. MARSILEA. By K. M. Gupta. pp. vi+113 (24×16 cm.). With two photographs in monochrome, 13 tables, and 40 figures including 1 map. New Delhi, 1962. Council of Scientific and Industrial Research. Price Rs. 16, or 33s., or \$ 5.

This is the second in the series of Botanical Monographs taken up by the Council of Scientific and Industrial Research, India. The subject of this monograph, after the first on *Gnetum*, is well chosen, and has been admirably executed by Dr. K. M. Gupta. The author has carried out critical studies on Indian species of *Marsilea* for several years and has taken considerable pains to collect the materials for this monograph.

The treatment of the subject, as in the previous monograph, is very good. The reproduction of original descriptions of the various species is a very happy thought, but one is puzzled why the English translation of the description is not given in each case. The inclusion of the pictures of two botanists, Alexander Braun and John Gilbert Baker, who made valuable contributions to our knowledge of *Marsilea* is a happy thought.

This work comprises previously published and unpublished morphological, ecological, taxonomical, embryological, and cytological studies of the several species of *Marsilea*, especially the Indian species of the genus. The comparative morphological studies of two different species, *M. minuta* (hydrophytic) and *M. aegyptiaca* (xerophytic), from Rajasthan in India have provided the material for the data on Morphology and Anatomy for the monograph. A summary of developmental studies by Campbell, Demalsy-Feller, Johnson, Feller, Andrews & Sharp, and Kolhatwar is included. The meagre work on cytology and ecology is summarized here with the help of figures and tables. The portion on Systematics is dealt with in considerable detail including three long tables and includes the synonymy of each species. The monograph ends with a short theoretical discussion. It has been